--20. A fiber grating comprising a core where a grating is written, a cladding for covering the core, and a coat layer for coating an outer face of the cladding,

wherein the coat layer is made from a UV transmitting resin and has a characteristic of transmitting UV at least of a specific wavelength band used for writing the grating and of curing by absorbing UV of a shorter wavelength band or a lower wavelength band than the specific wavelength band, and

the grating is written by irradiating the core with the UV of the specific wavelength band through the coat layer.

21. The fiber grating of claim 20, wherein the core is co-doped with Ge and Sn, and

a concentration of Ge is substantially the same as a concentration of Ge included in a core of another optical fiber to be connected to the fiber grating.

22. The fiber grating of claims 20 or 21, further comprising a secondary coat layer for coating an outer face of the coat layer,

wherein the secondary coat layer is made from a material having a negative coefficient of linear expansion.

23. The fiber grating of claim 20, wherein the coat layer is formed from a single coat film with a thickness of 30 $\mu$m or more.

24. The fiber grating of claim 21, wherein the core is further doped

with A1.

25. A method of fabricating a fiber grating comprising the steps of:

fabricating a glass fiber structure including a core where a grating is to be written and a cladding for covering the core;

forming a coat layer of a UV transmitting resin for covering an outer face of the glass fiber structure; and

writing the grating in the core by irradiating the core with first UV through the coat layer,

wherein the step of forming the coat layer includes a step of curing the UV transmitting resin through irradiation with second UV having a different wavelength from the first UV.

26. The method of fabricating a fiber grating of claim 25, wherein the first UV has a wavelength of 250 nm through 350 nm.

27. The method of fabricating a fiber grating of claim 25 or 26, wherein the coat layer is formed by a single coating method in a thickness of 30 $\mu$m through 50 $\mu$m.

28. A method of fabricating a fiber grating comprising the steps of:

fabricating a glass fiber structure including a core where a grating is to be written and a cladding for covering the core;

forming a coat layer of a UV transmitting resin for covering an outer face of the glass fiber structure; and

writing the grating in the core by irradiating the core with first UV through the coat layer,

wherein the step of writing the grating includes steps of:

placing all the coat layer, the cladding and the core in a position between a cylindrical lens and a focal point of the cylindrical lens and within a beam pattern of the UV converged toward the focal point by the cylindrical lens; and

irradiating the core with the UV through the cylindrical lens.

29. A method of fabricating a fiber grating comprising the steps of:

fabricating a glass fiber structure including a core where a grating is to be written and a cladding for covering the core;

forming a coat layer of a UV transmitting resin for covering an outer face of the glass fiber structure; and

writing the grating in the core by irradiating the core with first UV through the coat layer,

wherein, in the step of writing the grating, an outer face of the coat layer is internally in contact with an outer edge of a beam pattern of the UV.

30. The method of fabricating a fiber grating of claim 25, wherein the core is loaded with hydrogen before irradiating with the first UV.

31. The method of fabricating a fiber grating of claim 25, wherein the core is co-doped with Ge and Sn.

32. A method of fabricating a fiber grating comprising:

a tension application step of causing tensile strain along a fiber axial direction by previously applying a tensile force along the fiber axial direction to a grating write portion of an optical fiber to be fabricated into a fiber grating;

an irradiation step of writing the grating with a predetermined grating pitch along the fiber axial direction in a core of the optical fiber by irradiating the optical fiber with UV with keeping the tensile force applied in the tension application step; and

a tension release step of shifting the grating pitch of the grating written in the core toward a shorter wavelength by releasing the tensile force after the irradiation step.

33. A method of fabricating a fiber grating comprising:

a tension application step of causing tensile strain along a fiber axial direction by previously applying a tensile, force along the fiber axial direction to a grating write portion of an optical fiber to be fabricated into a fiber grating;

an irradiation step of writing the grating with a predetermined grating pitch along the fiber axial direction in a core of the optical fiber by irradiating the optical fiber with UV with keeping the tensile force applied in the tension application step;

a tension release step of shifting the grating pitch of the grating written in the core toward a shorter wavelength by releasing application of the tensile force after the irradiation step; and

a screening step of conducting a screening test on the grating write portion by applying a predetermined tensile force to the optical fiber after the tension release step.

34. A method of fabricating a fiber grating, by using a fiber grating fabrication apparatus including a UV irradiation system for irradiating, with UV, an optical fiber to be fabricated into a fiber grating and a tension applying mechanism for applying a tensile force in a fiber axial direction to the optical fiber, comprising:

an irradiation step of writing a grating along the fiber axial direction in a core of the optical fiber by irradiating the optical fiber with UV by using the UV irradiation system; and

a screening step of conducting a screening test on a portion where the grating has been written by applying a predetermined tensile force to the optical fiber by using the tension applying mechanism after the irradiation step.

35. A fiber grating fabrication apparatus comprising:

a UV irradiation system for writing a grating with a predetermined grating pitch along a fiber axial direction in a core of an optical fiber to be fabricated into a fiber grating by irradiating the optical fiber with UV; and

a tension applying mechanism for causing tensile strain along the fiber axial direction by temporarily applying a tensile force to a portion of the optical fiber irradiated with UV by the UV irradiation system,

wherein the tension applying mechanism is capable of applying a tensile force exceeding failure strength of the optical fiber.

36. The fiber grating fabrication apparatus of claim 35, wherein the tension applying mechanism includes:

a pair of fixing means for respectively fixing two portions of the optical fiber away from each other along the fiber axial direction and sandwiching the portion of the optical fiber irradiated with UV by the UV irradiation system; and

moving means for forcedly moving at least one of the pair of fixing means along the fiber axial direction away from and toward the other of the pair of fixing means.

37. A fiber grating fabrication apparatus comprising:

a UV irradiation system for writing a grating with a predetermined grating pitch along a fiber axial direction in a core of an optical fiber to be fabricated into a fiber grating by irradiating the optical-fiber with UV; and

a tension applying mechanism for causing tensile strain along the fiber axial direction by temporarily applying a tensile force to a portion of the optical fiber irradiated with UV by the UV irradiation system,

wherein the tension applying mechanism includes:

a pair of fixing means for respectively fixing two portions of the optical fiber away from each other along the fiber axial direction and sandwiching the portion of the optical fiber irradiated with UV by the UV irradiation system; and

moving means for forcedly moving at least one of the pair of fixing means along the fiber axial direction away from and toward the other of the pair of fixing means,